38. (Amended) The method of claim 34, said combining comprising using a beam splitter to combine the images by transmitting one image and reflecting the other image in the substantially common light path.

REMARKS

Favorable reconsideration of this application respectfully is requested.

The application includes claims 1-54. Claims 41-54 have been added. Claims 1, 2, 6-16, 18, 19, 21, 23-26, 29-32, 34, and 36-38 have been amended. The claimed subject matter is described in the specification.

New independent apparatus claim 41 and method claim 42 have been added. These claims point out an apparatus and method for rotating the direction or plane of polarization of linear (plane) polarized light by 90 degrees by using reflection. The polarization direction of the polarized light that is directed to a reflector is at a 45 degree angle relative to a linear axis, and the reflector is in a plane that is parallel to the linear axis. The linear polarized light propagates along an optical path, and, upon reflection of such light from the reflector, the polarization direction of the light rotates 90 degrees about the optical path. This feature or aspect of the invention is described in the specification, for example, at pages 4-6 and at pages 9-10. The subject matter of these claims is not disclosed in the prior art of record.

New dependent claims 43, 49 and 52 also point out the directly above-mentioned feature or aspect of the invention in combination with the subject matter of respective independent claims 1, 31 and 34.

Claim 1 has been amended to point out polarized light characteristics of the images provided by the pair of displays and the polarization direction is the same for both displays. Claim 1 also has been amended to point out that the beam splitter is at the bisectrix of the angle between the pair of displays so that one image is transmitted by the beam splitter and the other is reflected by the beam splitter; therefore, the images from the two displays can be directly viewed as a combined image that has the respective image portions having different polarization.

New claims 44-48 depend directly or indirectly from claim 1 and point out additional features, such as linear polarization (claim 44), the diagonal polarization direction of light from flat panel displays (claim 45), and the crossed relation of the polarization of the two images as combined by the beam splitter (claim 46). Claim 47 points out the circular polarization characteristic, and claim 48 points out the opposite direction of the circular polarization of the two images as combined by the beam splitter.

Claim 30 has been amended to clarify that the package is a storage package.

Claim 31 has been amended to point out that the left image and right image (e.g., images intended for viewing, respectively, by a viewer's left and right eyes) have optical polarization characteristics in the same direction; and those images are

combined in a common light path such that the polarization directions of the two image portions are different from each other.

New claims 49-51 depend from claim 31. Claim 49 is discussed above. Claims 50 and 51 point out the linear (claim 50) and circular polarization (claim 52) characteristics of the left and right images.

Claim 34 has been amended to point out that the images are presented on respective displays such that they have optical polarization in the same direction, and the combining step leads to the two images in a common light path but having different optical polarization.

New claims 52-54 depend from claim 34. Claim 52 is discussed above. Claims 53 and 54 point out that the presenting steps present the left and right eye images with linear polarization (claim 53) or circular polarization (claim 54) characteristics.

In the Office Action of August 28, 2002, the Examiner rejected claims 1-11 and 14-38 under 35 U.S.C. 102(e) in view of Fergason U.S. Patent No. 6,184,969. The Examiner also rejected claims 12, 13, 39 and 40 under 35 U.S.C. 103(a) in view of Fergason (6,184,969) in view of Wilkey, Jr. U.S. Patent No. 3,777,059.

Withdrawal of the rejection of claims 1-11 and 14-38 under 35 U.S.C. 102(e) as being unpatentable over Fergason '969 respectfully is requested.

As for claims 1 and dependent claims 2-11 and 14-29, which depend directly or indirectly from claim 1, Fergason does not disclose a pair of displays, each having a polarized light output, the polarization direction for both displays being the same, the

displays being at an angle to each other, AND a beam splitter at the bisectrix of the angle to combine images from the displays. In the paragraph bridging pages 2 and 3 of the Office Action, the Examiner refers to elements in Fig. 43 of Fergason. There is a single display 724d in Fig. 43 of Fergason–not two displays as set forth in the rejected claims. Polarization characteristics in Fergason are "dithered" or switched to move the location of respective pixels to different locations; but there are not two displays that have the same polarization direction and that are cooperative with a beam splitter such that when images from the two displays are combined, the combined image has one portion that has one polarization direction and the other portion that has a different polarization direction. In the present invention, as is recited in a number of claims, as the beam splitter reflects light from one of the displays, the polarization direction of the light therefrom is changed so that it is not the same as it was originally and is not the same as the polarization direction of the light from the other display that is transmitted through the beam splitter. Fergason does not disclose this claimed feature, nor do any of the other references.

(Claim 30 is discussed after the following three (3) paragraphs.)

As for method claims 31 and 34, Fergason '969 does not disclose the displaying or presenting of, by respective displays, left and right eye images having the same polarization, and combining those images in a common light path such that the respective images in the common light path have different optical polarization.

In discussing claim 31, the Examiner mentions a conjugate light path of Fergason, but the conjugate light paths (a) do not include images from two different displays and (b) are not a combined light path with light from two images (originally provided by the two displays) such that one image has one polarization and the other has a different polarization.

There are a number of advantages that may be obtained using the presenti invention, e.g., as is pointed out in the above-mentioned claims. Several of these advantages include improved resolution and reduced flicker, both of which are obtainable since both displays can be observed simultaneously. These advantages are not obtained in the prior art.

As for claim 30, Fergason '969 does not disclose a storage package in Fergason that can be closed for storage and opened for use or a hinge on which the cover portions may rotate. There are no storage package cover portions that can be closed to contain and protect a pair of displays and a beam splitter and can be opened to expose the displays and beam splitter in respective operative relation to present stereoscopic images for viewing.

The other claims, which are not specifically discussed here, point out additional features that distinguish over Fergason.

For the above reasons, then, the subject matter of claims 1-11 and 14-38 is not anticipated or unpatentable under 35 U.S.C. 102(e) by Fergason '969.

Withdrawal of the rejection of claims 12, 13, 39 and 40 under 35 U.S.C. 103(a) as being unpatentable over Fergason U.S. Patent No.6,184,969 in view of Wilkey, Jr. U.S. Patent No. 3,777,059 is respectfully requested for the above and following reasons.

Wilkey, Jr. discloses only one display–not two displays that have the same optical polarization. Neither Wilkey, Jr. nor Fergason '969 discloses a beam splitter for combining images from two displays such that the images are provided in a common light path from the beam splitter. Neither Wilkey, Jr. nor Fergason '969 discloses providing from two displays images that have the same polarization prior to being combined, e.g., by a beam splitter, and after being combined they have different polarizations. Although Wilkey, Jr. does mention mirror image since he reflects light from his single display by using a mirror, Wilkey, Jr. does not disclose reflecting light from two displays or using a beam splitter to change optical polarization characteristics to obtain images from two displays in a combined light path, wherein the images after being combined have different optical polarization.

Therefore, combining of Wilkey, Jr. with Fergason would not make up for the deficiencies in Fergason and would not make the subject matter of claims 11, 12, 39 and 40 unpatentable or obvious to a person having ordinary skill in the art under 35 U.S.C. 103(a).

The Dolgoff U.S. Patent No. 5,300,942, which was cited but not applied, also does not disclose the above-discussed features of using two displays that have the

same optical polarization and combining the images from those displays using a beam splitter to obtain a combined image having image portions with different polarization. Dologoff also does not disclose the packaged stereo display system of claim 30.

For the above reasons it is believed that all claims are allowable, and an early indication of allowance earnestly is solicited.

A fee for 14 new claims (two independent and 12 dependent) is paid herewith by authorization to charge applicant's attorneys' Deposit Account No. 18-0988, Order VEIAP103USA.

A fee for a one month extension of time also is paid herewith by authorization to charge applicant's attorneys' Deposit Account No. 18-0988, Order VEIAP103USA.

If this Amendment is not considered to place the application in condition for allowance, then Applicant's undersigned attorney respectfully requests Examiner Lesperance to telephone the undersigned to arrange a telephone interview to expedite favorable consideration of the application.

Respectfully submitted,
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DATE: Dec. 30, 2002

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Enclosures: Appendix A
Petition for 1 month extension of time
Transmittal sheet

APPENDIX A

Following are marked-up copies of the amended claims with added material underlined and changes in brackets. ***Included for the Examiner's convenience are the non-amended claims so that this Appendix A contains all of claims 1-49 in this application.***

1. (Amended) A display system comprising [multiple] a pair of displays, each having a polarized light output, the polarization direction for both displays being the same, the displays being at an angle to each other, [display generators] and a beam splitter at the bisectrix of said angle to combine images from the displays whereby one image is transmitted by the beam splitter and the other image is reflected by the beam splitter to provide [display generators to enhance performance by] direct view of images from the displays.

2. (Amended) The display system of claim 1 in which the displays [display generators] are flat panel LCDs.

3. The display system of claim 2 in which the LCDs are identical and the polarization of the LCDs are at 45 degrees to the horizontal, whereby an image from one LCD transmitted through the beam splitter for viewing and the image from the other LCD which is reflected from the beam splitter will have linear polarization at right angles.

4. The display system of claim 3 in which polarizers are used to separate the images for right and left eye.

5. The display system of claim 4, wherein the polarizers are polarized lenses in eyeglass frames.

6. (Amended) The display system of claim 3, in which the polarization is modified by adding quarter wave plates, respectively, to the light paths from the LCDs so that the [output light is] images from the respective displays as viewed via the beam splitter are separated by right and left circular polarized light.

7. (Amended) The display system of claim 3, in which circular polarization is created by a single quarter wave plate located [added] between the beam splitter and the eye of a [the] viewer.

8. (Amended) The display system of claim 2, in which a stereo pair makes up a selected region of the images from the displays [display generators].

9. (Amended) The display system of claim 2, in which the displays [display generators] are disposed at right angles and are in the vertical planes.

10. (Amended) The display system of claim 2, in which [the] one display [generator] for direct viewing through the beam splitter is in the vertical plane and the display [generator] that is reflected in the beam splitter is in the horizontal plane.

11. (Amended) The display system of claim 10, in which [the] a stereo signal [is] received by the display system is [as] a stereo image pair and the display [generator] directly viewed through the beam splitter is in the vertical plane and is scanned from top to bottom and the display generator that is reflected by the beam splitter in the horizontal plane and is scanned from bottom to top.

12. (Amended) The display system of claim 10, in which the image signal for the [reflected] display that is viewed by reflection by the beam splitter [generator in the horizontal plane] is inverted top to bottom.

13. (Amended) The display system of claim 2, in which the image signal for the [reflected] display that provides an image that is reflected [generator] is inverted from right to left electronically.

14. (Amended) The display systems of claim 2, and in which a stereo signal is received as a stereo pair, one of the stereo pairs is provided to one display [generator] and the other of the stereo pairs is provided to the other display [generator], and the display [generator] viewed through the beam splitter is scanned from left to right and the display [generator] that is reflected by the beam splitter for viewing is scanned from right to left.

15. (Amended) The display system of claim 1 in which a field sequential signal is displayed such that alternate fields are displayed on both displays [two display generators] so that each field is displayed for a full frame.

16. (Amended) The display system of claim 1, in which the displays [display generators] are made up of red green and blue color sub pixels to form picture elements and/or arranged to overlay each other so as to minimize color halos and color fringes.

17. The display system of claim 16, wherein the directional organization of providing data to color sub pixels in one LCD is in one direction and the directional organization of providing data to color sub pixels in the other LCD is in the opposite direction.

18. (Amended) The display system of claim 16 in which a field sequential signal is displayed such that alternate fields are displayed on the two displays [display generators] so that each field is displayed for a full frame.

19. (Amended) The display system of claim 1, further comprising a mount to position the displays [display generators] relative to each other in perpendicular planes.

20. The display system of claim 19, wherein the mount includes a mount for the beam splitter.

21. (Amended) The display system of claim 20, said mount including a cubical structure, the beam splitter being in the cubical structure and the cubical structure having open areas receiving light from the respective displays [image generators] and passing such light to the beam splitter.

22. The display system of claim 1, further comprising a light absorber for absorbing light from the beam splitter which is not directed to a viewer for viewing.

23. (Amended) The display system of claim 1, further comprising a package for containing the displays [display generators] and the beam splitter.

24. (Amended) The display system of claim 23, said package comprising cover portions coupled by a hinge and movable to contain in protected relation the

displays [display generators] and beam splitter and openable to provide access and use of the displays [display generators] and beam splitter.

25. (Amended) The display system of claim 24, said cover portions being openable to permit arrangement of the displays [display generators] in perpendicular planes with the beam splitter therebetween.

26. (Amended) The display system of claim 24, said cover portions being openable to permit arrangement of the displays [display generators] in parallel relation in a common plane.

27. The display system of claim 1, further comprising a data processing system for obtaining and organizing image data and presenting the image data for display.

28. The display system of claim 27, said data processing system including a processor, a memory and connections to the respective display generators.

29. (Amended) The display system of claim 28, further comprising operating software to invert the data for presentation to one of the displays [display generators] for displaying the data in inverted relation to the data displayed by the other displays [display generator].

30. (Amended) A packaged stereoscopic display system, comprising a pair of displays, a beam splitter, a storage package containing the displays and beam splitter, the storage package including a pair of cover portions and a hinge connecting the cover portions allowing the cover portions to be closed to contained in protected closed relation the displays and beam splitter, and to be opened to expose the displays and beam splitter in respective operative relation to present stereoscopic images for viewing.

31. (Amended) A method of displaying stereo images, comprising simultaneously displaying a left image on a display and a right image on another display such that the left and right images have the optical polarization in the same direction, and using a beam splitter combining those images in a common light path such that the

optical polarization of the left image portion and the right image portion are different in such common light path.

32. (Amended) The method of claim 31, further comprising discriminating the respective images in the common light path using optical polarization.

33. The method of claim 31, wherein the images are color images, each being composed of an assemblage of lines of different respective colors, and wherein the color image from one display is an arrangement in a one sequence and the color image from the other display is in an arrangement in the opposite sequence.

34. (Amended) A method of presenting a stereoscopic image for viewing, comprising presenting a left eye image on a display [an image generator], presenting a right eye image on another display that is at an angle relative to the first mentioned display, both said presenting steps presenting such images having optical polarization in the same direction [image generator], and combining in a substantially common light path the respective images such that the respective images in the common light path have different optical polarization.

35. The method of claim 34, further comprising discriminating between the left eye image and right eye image for viewing by respective left and right eyes the respective left and right eye images from the light in the common light path.

36. (Amended) The method of claim 34, further comprising inverting the image data for one of the images for presenting for viewing in substantially superposed relation to the other [eye] image.

37. (Amended) The method of claim 36, said combining [further] comprising using a beam splitter to combine the images by transmitting one image and reflecting the other image.

38. (Amended) The method of claim 34, said combining [further] comprising using a beam splitter to combine the images by transmitting one image and reflecting the other image in the substantially common light path.

39. The method of claim 38, said inverting comprising inverting from top to bottom.

40. The method of claim 38, said inverting comprising inverting from left to right.

41. (New) A device for rotating the polarization direction of polarized light, comprising

a source of linear polarized light that has a polarization direction at 45 degrees to a linear axis and is transmitted along an optical path, and

a reflector in a plane that is parallel to and intersects the linear axis and oriented to reflect such linear polarized light,

whereby the polarization direction of the reflected linear polarized light relative to the polarization direction of the linear polarized light prior to reflection is rotated 90 degrees about the optical path.

42. (New) A method of rotating the polarization direction of linear polarized light that has a polarization direction at 45 degrees to a linear axis and is transmitted (propagates) along an optical path, comprising

reflecting such linear polarized light using a reflector that is in a plane that is parallel to and intersects the linear axis,

whereby the polarization direction of the reflected linear polarized light relative to the polarization direction of the linear polarized light prior to reflection is rotated 90 degrees about the optical path.

43. (New) The display system of claim 1, wherein the displays and the beam splitter are in respective planes that are parallel to a common linear axis,

wherein light from the displays is linear polarized,

wherein the light from one of the displays that is reflected by the beam splitter has a polarization direction at 45 degrees to the linear axis and is transmitted along an optical path,

whereby upon reflection by the beam splitter the polarization direction of the reflected linear polarized light relative to the polarization direction of the linear polarized light prior to reflection is rotated 90 degrees about the optical path.

44. (New) The display system of claim 1, wherein the polarized light output is linear polarized light.

45. (New) The display system of claim 44, wherein the displays are flat panel displays having a generally rectangular shape and the direction of polarization for both displays is diagonal relative to such generally rectangular shape.

46. (New) The display system of claim 44, wherein the beam splitter combines images from both displays to provide viewable overlapping images that respectively have crossed polarization.

47. (New) The display system of claim 1, wherein the polarization for both displays is circular.

48. (New) The display system of claim 47, wherein the beam splitter combines images from both displays to provide viewable overlapping images that respectively have circular polarization in opposite directions.

49. (New) The method of claim 31, wherein light forming said images is linear polarized light, and the polarization direction of the linear polarized light forming one of said images is at 45 degrees to a linear axis and is transmitted (propagates) along an optical path,

said combining comprising reflecting into such common light path such linear polarized light forming said one of said images by using the beam splitter with the beam splitter in a plane is parallel to and intersects the linear axis,

whereby the polarization direction of the reflected linear polarized light relative to the polarization direction of the linear polarized light prior to reflection is rotated 90 degrees about the optical path.

50. (New) The method of claim 31, wherein said displaying comprises displaying such left and right images having linear polarization.

51. (New) The method of claim 31, wherein said displaying comprises displaying such left and right images having circular polarization

52. (New) The method of claim 34, wherein the displays are in respective planes that are parallel to a linear axis and light forming said images is linear polarized light, and the polarization direction of the linear polarized light forming one of said images is at 45 degrees to a linear axis and is transmitted (propagates) along an optical path,

said combining comprising reflecting into such common light path such linear polarized light forming said one of said images by using the beam splitter with the beam splitter in a plane that is parallel to and intersects the linear axis,

whereby the polarization direction of the reflected linear polarized light relative to the polarization direction of the linear polarized light prior to reflection is rotated 90 degrees about the optical path.

53. (New) The method of claim 34, wherein both said presenting steps present such images having linear polarization.

54. (New) The method of claim 34, wherein both said presenting steps present such images having circular polarization.

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